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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/526,919	03/08/2005	Hiroshi Kushitani	2005_0243A	7521

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EXAMINER

SUMMONS, BARBARA

ART UNIT PAPER NUMBER

2817

DATE MAILED: 08/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	10/526,919		KUSHITANI ET AL.	
	Examiner		Art Unit	
	Barbara Summons		2817	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 March 2005 (pre-amend.).
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,2,4,5 and 7-13 is/are allowed.
- 6) ☒ Claim(s) 3,6 and 14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 March 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>3/8/05</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. Figures 14 and 15 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated (see e.g. page 1, line 8 to page 2, line 3 and page 4, lines 1-3). See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the entire embodiment of claims 11 and 14 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered. Note that the figures only disclose an embodiment with transmission lines 6-9 having one end connected to the surface acoustic wave (SAW) element and the other end connected to ground (see the specification at page 6, line 26 to page 7, line 8), and the figures show only a transmission line 10 for connecting the antenna terminal to the SAW element (i.e. the third transmission line in claim 14). Therefore, no figure shows the claimed subject matter of the recited transmission line connecting the transmission terminal and the SAW element or the transmission line connecting the reception terminal and the SAW element or an additional transmission

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line between such specifically connected structures. Indeed, the transmission lines shown appear to be inductors connected between SAW resonators and ground (Fig. 6) with transmission line 10 corresponding to inductor 42 (see the spec. at page 8, lines 16-17) and the SAW element shown in Fig. 6 can only be half of the duplexer described in claims 11 and 14, since it only has an input and an output wherein the one being terminal 41 having inductor 42 is connected to the antenna terminal and the other of which can only be connected to one of the reception or transmission terminal and has no described or shown transmission line associated therewith.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The disclosure is objected to because of the following informalities: On page 6, on line 27, it appears that "17" should correctly be -- 17c -- (see page 6, lines 20-21 and Fig. 3). On page 7, on line 11, -- via hole -- should be inserted before "27".

Appropriate correction is required.

Claim Objections

4. Claim 2 is objected to because of the following informalities:

In claim 2, on line 2, it appears that "connection terminal" should be -- output terminal --. If this is not the case, then an explanation of what is meant by "a connection terminal" is required. Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. § 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 3 and 6 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3 is unclear because the recitation of "one or more dielectric layers" is totally confusing as to how it relates to the previously recited "first dielectric layer" and "second dielectric layer" (see claim 1, lines 2-6) and how it affects their arrangement. Also, the "one" part of "one or more dielectric layers" is redundant since claim 1 has already recited one dielectric layer with the plurality of transmission lines (lines 2-3).

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Claim 3 also recites "the transmission line" which is unclear as to how it relates to the previously recited "plurality of transmission lines" (see claim 1, lines 2-3).

The Examiner considers the claim to basically mean: - - A surface acoustic wave filter according to claim 1, wherein the first dielectric layer includes multiple dielectric layers, and at least one of the plurality of transmission lines is disposed on the multiple dielectric layers - -.

Claim 6 recites "the transmission line" which is unclear as to how it relates to the plurality of transmission lines previously recited. Claim 6 also recites "the connection via hole is connected to the transmission line", but claim 5 has already recited that the via connection hole connects both the first and second grounds together, and no such connection via hole that both connects the first and second grounds and also connects to a transmission line is shown in the figures. That is, a connection via hole either connects the two grounds, as via holes 57-60 in Fig. 11, or a connection via hole connects one of the transmission lines to one of the grounds. However, the connection via holes 57-60 do also connect to - - the additional transmission line - - 11. Therefore, in claim 6, it appears that either "the transmission line" should be changed to - - the additional transmission line - -, or claim 6 should be rewritten to indicate that its "connection via hole" is different from the one recited in claim 5, or the dependency of claim 6 should be changed and "the connection via hole" changed to - - a connection via hole - - to start fresh.

Clarification is required.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claim 14 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Taniguchi et al. U.S. 6,822,537 in view of either one of the Ponchak et al. article (cited by Applicants) or Hayashi U.S. 2004/0127182.

Taniguchi et al. discloses (Figs. 1A-4) a SAW filter comprising a SAW element being the SAW duplexer/branching filter 1 having SAW Rx and Tx filters 3 and 4; a transmission terminal 6; a reception terminal 7; an antenna terminal ANT; a dielectric layer 8, the dielectric layer 8 (Fig. 4) including: a second transmission line 24 for connecting the reception terminal 7 to the SAW filter 4 as shown in Fig. 3 (see col. 8, lines 18-20 and 24-26); a third transmission line 22 for connecting the antenna terminal to the SAW filter 4 (see Fig. 3 and col. 8, lines 16-17); and a first transmission line that

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is not shown but is disclosed as being on the other half of the chip by SAW filter 3 and similar to transmission line 24 but for connecting the transmission terminal 6 to the SAW filter 3 (see col. 8, lines 33-36); and wherein the dielectric layer 8 further includes an additional transmission line 23 that is between the second transmission line 24 and the third transmission line 22 and is connected to ground (see col. 8, lines 17-18) so that it inherently suppresses an electric field coupling between the neighboring transmission lines by virtue of its ground connection. Note that the additional transmission line could also be considered to be 21 between the first transmission line that is not shown, but on the area B (col. 8, lines 33-36), and the second and third transmission lines 24 and 22.

However, the additional transmission line is not connected to ground at an interval equal to or less than the wavelength of the operating frequency.

The Ponchak et al. article discloses that it is known to provide isolation in wireless device multilayer multichip packages by using the combination of closely spaced via holes (see page 91, the entire right column) with upper ground strips (Fig. 7 and *ibid.*) and lower ground.

Similarly, Hayashi discloses (Fig. 17) an isolation ground strip SG with closely spaced via holes HG (see e.g. section [0169]) that prevent interference between neighboring transmission lines and notes that the combination of a ground electrode SG and the via holes increases isolation (see section [0119]) vs. only one of the structures alone (see section [0120]). Note the device of Hayashi is also a SAW device (Fig. 23).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the device of Taniguchi et al. by having

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added closely spaced via holes to the ground transmission line 23 (Fig. 4) because such an obvious modification as suggested by the exemplary teaching thereof by either one of Ponchak et al. (Fig. 7 and the right col. of page 91) or Hayashi (Fig. 17 and section [0169]), would have provided the benefit of increased isolation and suppression of electrical interference between neighboring signal carrying transmission lines as suggested by each of Ponchak (ibid.) and Hayashi (sections [0119]-[0120]).

9. Claim 14 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Nakata U.S. 5,515,015 (cited by Applicants) in view of either one of the Ponchak et al. article (cited by Applicants) or Hayashi U.S. 2004/0127182.

In agreement with the International Search Report, Fig. 19 of Nakata discloses a SAW element 13/14 on a dielectric layer, the device having an antenna terminal 7 with transmission lines 9/10 connected thereto and to the SAW element; and two other transmission lines connected to the SAW element and a transmission terminal and a reception terminal (not shown) that are inherently at the missing right-hand of the figure.

However, Nakata does not show an additional transmission line between neighboring transmission lines and connected to ground at intervals equal to or less than a wavelength of an operating frequency of the device.

As discussed in the immediately preceding rejection, each of Ponchak et al. and Hayashi disclose such a structure for preventing interference between neighboring transmission lines.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the SAW device of Nakata (Fig. 19) by having provided a transmission line running between the two SAW filters and the neighboring transmission lines at the right in the figure that run to the transmission and reception terminals, the transmission line being connect to ground by closely spaced via holes, for the same reasons given in the immediately preceding rejection, that is, because such an obvious modification, as suggested by the exemplary teachings of either one of Ponchak or Hayashi, would have provided the benefits of isolation between the transmission an reception transmission lines.

Allowable Subject Matter

10. Claims 1, 2, 4, 5 and 7-13 are allowable over the prior art of record.
11. Claims 3 and 6 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ohnuki et al. discloses a SAW element 33/43 (Fig. 1) that has a dielectric layer with two transmission lines 22 an 23 separated by a ground line 26 and having ground planes above 11 and below 15 that are connected to ground line 26 (col. 6, lines 26-28).

Hongo et al. U.S. 2005/0116790 shows a SAW duplexer with upper/lower ground layers 61/71 (Fig. 2) connected by via holes 4 that surround transmission line 7 (Fig. 3).

Cheema et al. U.S. 2005/0206477 discloses a SAW duplexer with upper/lower grounds 42/44 (Figs. 8 and 9) that are connected by via holes 48/49 that also connect to grounded transmission lines that run diagonally between the matching line 34 and the input/output terminal lines.

Yamakawa et al. U.S. 6,985,712 discloses a SAW device (Fig. 7) that includes a ground transmission line with via holes 101a/101b (Fig. 8) that has a ninety degree turn and is between transmission lines 411a and 414b and is connected to a ground layer 106g (Fig. 14).

Tabuchi et al. U.S. 5,202,652 discloses a SAW duplexer (Figs. 2A and 5B) that has a ground transmission line with via holes 31 (Fig. 4C) between the two transmission lines 32/34 wherein the transmission lines are also connected to the SAW element since the Fig. 4A inductors are the lines 34.

Kimura et al. JP 2002-231849 discloses a SAW device with a ground transmission line 13 (Figs. 2-4, 6 and 7) that has a ninety degree turn and that isolates input/output transmission lines.

Uriu et al. U.S. 6,750,737 discloses a SAW device (Fig. 3) that has a ground transmission line G3 [Fig. 1 and Fig. 4(b)] that runs between adjacent transmission lines and is connected to ground by multiple via holes.

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13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barbara Summons whose telephone number is (571) 272-1771. The examiner can normally be reached on M-Th, M-Fr.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bob Pascal can be reached on (571) 271-1769. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

bs
August 8, 2006


BARBARA SUMMONS
PRIMARY EXAMINER